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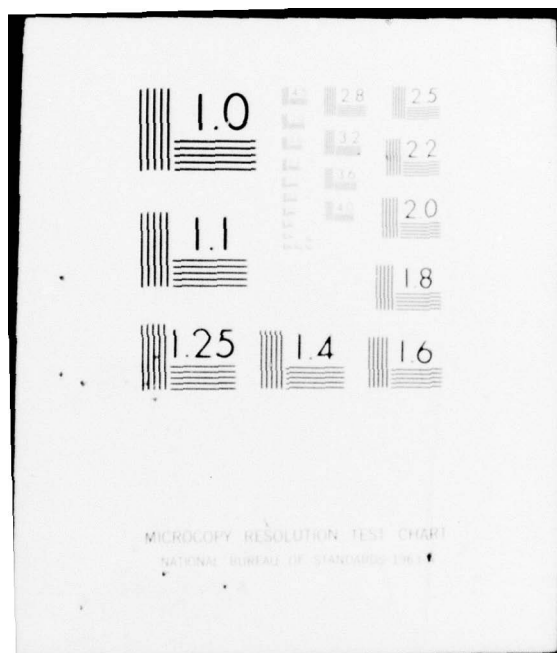


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NO. 384

A HEATED OPERATING BOARD FOR MAINTENANCE OF
NORMAL BODY TEMPERATURE FOLLOWING
ANESTHESIA IN SMALL MAMMALS (U)

by

John G. Clement, PhD.

ACN 13D03

MAY 1977

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ABSTRACT

Following administration of sodium pentobarbital to induce anesthesia in rats and guinea pigs, a decrease in body temperature was observed. The normal body temperature could be maintained if the animal was placed on a heated operating board constructed from items already present in the laboratory. A rectal probe connected to a temperature monitor controlled the heater-water pump which circulated warm water through the operating board whenever the animal's temperature decreased below a pre-set value.

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INTRODUCTION

There is in most cases a fall in body core temperature following I.P. administration of sodium pentobarbital¹ to promote anesthesia in small mammals such as rats and guinea pigs. Typical cases are illustrated in Table I. In certain kinds of experiments this decrease in the body temperature is not at all desirable and if the body is not maintained isothermal another variable is introduced into the experiment.

It is customary for some laboratories to use a heating blanket to keep the animal warm; however, there is a risk that the normal body temperature may not be accurately maintained. The following is a description of a heated operating board (See Figure 1) which was made in our laboratory using equipment already on hand. It consists of (a) a

¹ Nembutal (R) Abbott Laboratories

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Haake water circulating pump;² (b) a YSI temperature controlling unit;³ and (c) an operating board made out of plexiglass. Channels for the circulation of water were cut in a thick (16.0 mm) piece of plexiglass. A thin sheet of plexiglass (1.5 mm) was then glued on top to seal the channels. The inlet and outlet were taped and brass fittings inserted to accept the plastic tubing from the circulating water pump.

The set-up (Figure 1) was arranged as follows: the outlet electrical plug of the Haake pump was plugged into the YSI temperature control unit "heat" outlet. The heater water pump thermostat was set at approximately 40°C (i.e. above the animal's normal body temperature, since the YSI temperature controller turns the heater water pump on or off in response to the temperature recorded by the rectal probe). The temperature control unit was set to the average temperature for the particular species being used and the temperature probe was then inserted approximately 6 cm into the rectum of the anesthetized animal. Under these conditions if the animal's temperature falls, the temperature control unit will turn on the heater water pump and circulate warm water through the operating board thus maintaining the pre-set temperature. When the pre-set temperature is reached the pump turns off and the board is cooled.

This particular arrangement gives more critical control of body core temperature and also allows maintenance of core temperature during surgery without the worry of soiling the heating pad with blood

² Haake Heater Circulating Pump
Berlin, West Germany.

³ YSI Model 73ATA Indicating Controller
Yellow Spring, Ohio

or urine, or getting it wet with saline. The data in Table I show that use of the heated operating board kept the body temperature very close to normal following induction of anesthesia with sodium pentobarbital.

The operating board pictured in Fig. 1 was used in conjunction with a Harvard guillotine. The heated tongue portion was made to sit on the guillotine base. Adjusting screws were placed at the end of the tongue to allow the unit to be placed as close to the knife edge as possible. A similar but larger arrangement is routinely used to maintain proper body temperature following anesthesia in cats and rabbits.

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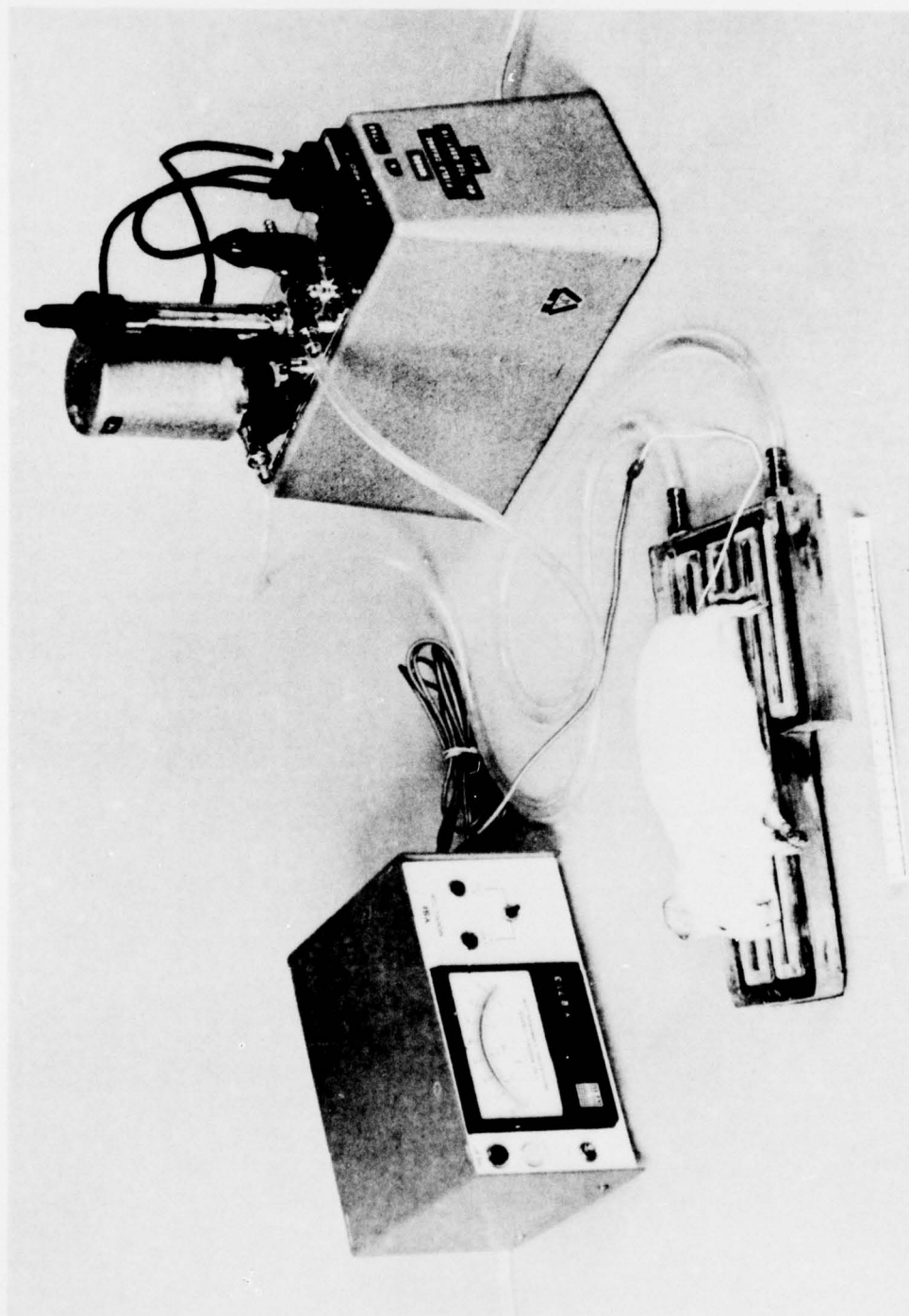


Figure 1. HEATED OPERATING BOARD SET-UP FOR MAINTENANCE OF NORMAL BODY TEMPERATURE FOLLOWING ANESTHESIA.

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TABLE I
MAINTENANCE OF NORMAL BODY TEMPERATURE FOLLOWING SODIUM PENTOBARBITAL
ANESTHESIA BY USING A HEATED OPERATING BOARD

SPECIES	HEATED OPERATING BOARD	BODY TEMPERATURE (°C)				
		0 ¹	5	10	15	30
Rat	Yes	37.0 ± 0.16 ²	36.7 ± 0.2	37.4 ± 0.2	37.9 ± 0.1	38.3 ± 0.2
	No	37.4 ± 0.1	35.8 ± 0.1	34.6 ± 0.1	34.4 ± 0.1	34.2 ± 0.2
Guinea Pig	Yes	37.6 ± 0.1	37.8 ± 0.2	37.9 ± 0.2	37.8 ± 0.2	37.5 ± 0.2
	No	37.0 ± 0.1	36.8 ± 0.3	36.0 ± 0.2	34.3 ± 0.4	34.7 ± 0.1

¹ 1 minutes after administration of sodium pentobarbital.

² mean ± SEM N = 5

Animals were anesthetized with 50 mg/kg IP sodium pentobarbital. The animals usually lost their righting reflex within 5.0 minutes and were then placed on the board and covered with a few layers of gauze.

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13. ABSTRACT <p>Following administration of sodium pentobarbital to induce anesthesia in rats and guinea pigs, a decrease in body temperature was observed. The normal body temperature could be maintained if the animal was placed on a heated operating board constructed from items already present in the laboratory. A rectal probe connected to a temperature monitor controlled the heater-water pump which circulated warm water through the operating board whenever the animal's temperature decreased below a pre-set value.</p> <p>(U)</p>			

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KEY WORDS

hypothermia
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